

GASTROSTOMY BY WITZEL'S METHOD FOR PRIMARY CANCER OF THE CÆSOPHAGUS.

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THE patient, S. S., aged forty-eight, occupation puddler in rolling mills, was admitted to the Jefferson Hospital July 31, 1893, at the request of Dr. A. G. Miner, of Niles, Ohio. His father died of asthma, his mother of cancer of the breast. He has always had good health with the exception of an occasional brief attack of rheumatism. For the past thirteen months he has experienced trouble in swallowing; seven months ago he could swallow solid food without much discomfort, but now can swallow nothing but liquids. He states that the constriction came on gradually and that he noticed from time to time the lessening of the calibre of his cæso-phagus. When he takes nourishment he feels first an impediment to the passage at a point corresponding to the sterno-clavicular articulation; then the food passes with comparative ease until it reaches a point which corresponds to half an inch above the lower end of the ensiform appendix. Here he says he can feel a distinct obstruction, and while the food is passing this point he experiences pain in the median line posteriorly, under the inferior angles of both scapulæ (more severe under the left), in the epigastric region, though slight, and in the precordial region. The pain is darting in character.

During the past four months he has had slight attacks of hæmatemesis. On July 27, 1893, he lost considerable blood, enough to make him faint, but he attributes this to the introduction of an cæso-phageal bougie. He had had gradually increasing emaciation, and has lost forty-nine pounds in the last thirteen months, his weight in June, 1892, being 168 pounds, and in July, 1893, 119 pounds. During the last ten weeks he has had cæso-phageal bougies passed

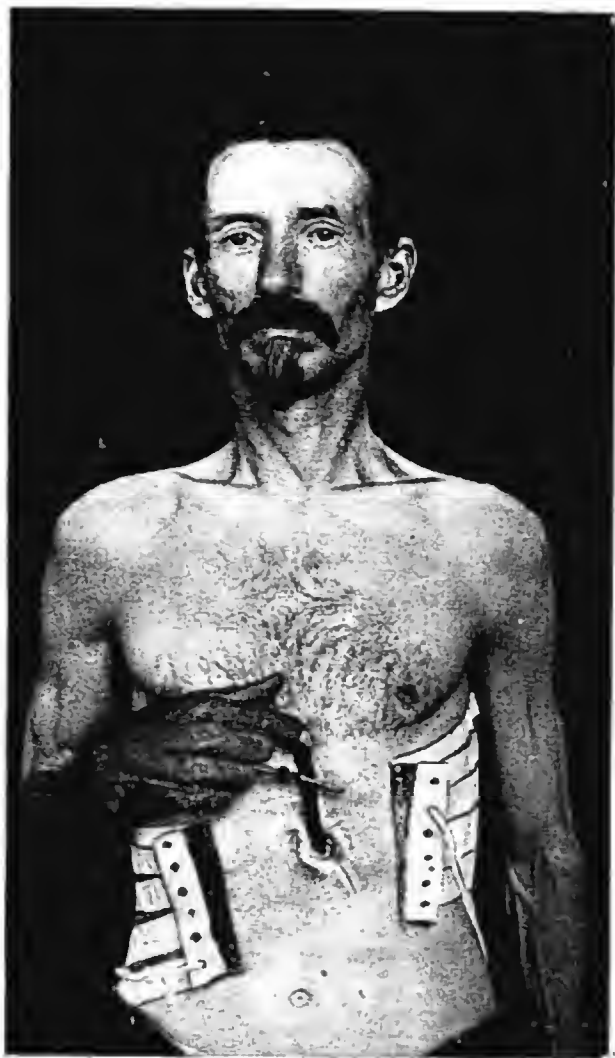


FIG. 1.—Gastrostomy by Witze's method, two months after operation, showing the absence of leakage and the consequent healthy skin, also the laced plaster retaining the tube and dressing.

twice a week. On the 31st of July I passed a No. 3 rectal bougie through the stricture.

He has never swallowed any corrosive fluids, and has had no traumatism. He does not indulge in alcoholic stimulants stronger than beer, and limits this to two or three glasses a day. He denies all history of syphilis. His appetite is impaired, tongue coated and bowels constipated. The urine is negative.

There was a resistance in passing the oesophageal bougie (circumference 4.2 centimetres) at ten and a half inches from the teeth, and at twelve inches the bougie would not pass.

Operation, August 2, 1893. An incision four inches long was made, beginning at the middle line and running to the left, a finger's breadth below the border of the ribs. The muscular fibres of the rectus were separated by the fingers and not divided. The liver was seen as soon as the peritoneal cavity was opened. Two fingers thrust in, however, very readily seized the stomach. This was brought forward and outside the wound, the margins being packed with gauze. A rubber tube, five inches in length (Size 25, Fr. catheter scale), was introduced into the stomach and infolded by two rows of Lembert sutures, after Witzel's method. The opening in the stomach was made toward the cardiac extremity and the tube lay parallel to the external wound, its external end emerging near the median line. Three stitches were now inserted into the walls of the stomach but not tied before it was returned to the abdomen, their needles being left threaded. As soon as the stomach was returned these needles were thrust through the abdominal wall and the stomach brought up to the margin of the opening. The tube was retained in place by a catgut stitch passed through the wall of the stomach and through a part of the wall of the tube so as not to open its calibre. About one inch of the tube was thrust into the stomach. The edges of the abdominal opening were now sutured by silkworm-gut and the ordinary dressing applied. A clip was placed on the tube to prevent the escape of the contents of the stomach.

September 28, 1893. The patient made an excellent recovery, without incident, excepting in one respect. On the second day after the operation the dressing became twisted in his movements in bed, and the tube was pulled out of the stomach. In order to replace it I was obliged to cut three stitches in the external wound. When the tube had been replaced these stitches were re-inserted. Apparently, however, such adhesion had formed that no harm was done by this accident excepting to delay the closure of the wound.

By the middle of September he began to expectorate some bloody mucus, presumably coming from the ulceration of the carcinoma in the œsophagus. He has gained about four pounds in weight, however, since the operation. For some weeks he has been unable to swallow even a mouthful of water. What nutritive gain there is from feeding, I presume has been almost counteracted by the

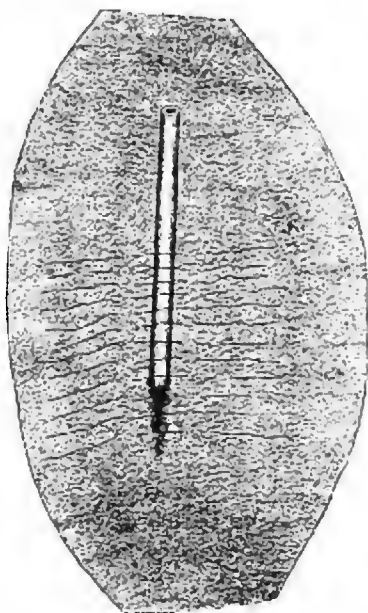


FIG. 2.—Witzel's method for Gastrostomy, showing application of sutures in wall of stomach embedding tube obliquely therein.

progress of the disease. Immediately after the operation he was fed for two days by rectal enemata. Then I began with small amounts of milk, poured into the stomach through the tube. This feeding has been gradually increased, until at the present time his daily food may be summarized about as follows: Milk, two quarts; beef, mutton and chicken broth, each about twenty ounces; and a dozen eggs.

This is varied by substituting gruel, thin custard and other similar food. He is walking about with much comfort. The tube is held in place by a gauze dressing, which in turn is retained by rubber adhesive plaster on each side. This is laced through eyelet holes. (See Plate, Fig. 1). No escape of the gastric contents has taken place alongside of the tube.

November 1, 1893. The patient is still doing well three months after the operation. There is absolutely no leakage whatever.

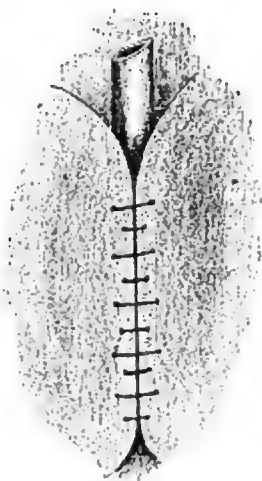


FIG. 3.—Sutures tied completely embedding tube for same distance.

Greig Smith states that the operation of gastrostomy was first proposed by Egebert, a Norwegian surgeon, in 1837, received its name from Sedillot, in 1846, but had a very unsatisfactory history and development until the time of Sidney Jones, of St. Thomas' Hospital, London, in 1874. Since then it has made rapid progress in favor in the profession, and a variety of different methods of its performance have been devised, until now its technique is presumably so satisfactory that but little improvement can be made upon it. The conditions which demand the

operation are, of course, any cause which prevents the introduction of aliment into the stomach by the mouth, for instance, stricture of the œsophagus from any reason, whether by cancer, cicatricial constrictions from caustics, etc., occasionally from the pressure of extra-œsophageal growths, or from malignant disease in the mouth or pharynx. Whitehead¹ has reported a case in which gastrostomy was done on account of obstruction due to a diverticulum.

There are practically five methods by which gastrostomy is done.

(1) The method originally proposed by Egebert, and modified in its details by Fenger and Howse.² In this an abdominal incision is made parallel with the border of the ribs, and the stomach is attached by sutures to the abdominal wall. Two sutures are placed in the wall of the stomach in order later to identify the exact position for puncture (Bryant), and the stomach is not opened until the third or fourth day. This method has given rise to so much trouble, however, especially from leakage, that various devices have been employed for the purpose of preventing this annoyance, which, in consequence of the irritation from the escaping gastric juice, caused wide-spread eczema or even ulceration. Handford³ notices, for instance, "a hernia-like protrusion of the mucous membrane of the stomach from the fistulous opening, forming a red, mushroom-shaped, insensitive mass, nearly two inches in diameter. This was easily replaced, but led to constant leakage of the stomach contents." Moreover, it is very important to observe that in Whitehead's case, above alluded to, the post-mortem showed that the adhesions of the stomach to the abdominal wall had so loosened by traction that they were very slight indeed when the patient died, six months and a half after the operation. Hence, the importance of secure suturing of the stomach to the abdominal wall, as I believe I have obtained in my own case by suturing the stomach to the abdominal wall.

¹ *Lancet*, 1891, I, p. 11.

² *Heath's Dict. of Surg.*, p. 590.

³ *Lancet*, 1891, II, 988.

(2) The method of Von Hacker.¹ This operator proposed to use the belly of the rectus muscle as a sphincter. In the first method of operating the fibres of this muscle are divided by a transverse incision. Von Hacker proposed to make a vertical incision and a blunt dissection of the belly of the muscle, hoping that the rectus fibres would thus act as a sphincter. Girard² modified this by crossing the fibres of the muscle so as to form a more efficient sphincter. Von Hacker himself has been obliged to use the Scheimpflug canula in order to prevent leakage.

(3) The method of Hahn.³ In this a return is made to the original transverse incision, but a second incision is made in the eighth intercostal space. The stomach is drawn through this space, and fastened there between the cartilages. In addition to the danger of possibly opening the chest, necrosis of the cartilages has taken place, although Hahn affirms that there is no danger either to the diaphragm or the pleura. He believed that the cartilages of the ribs acted like a sphincter or stop-cock.

(4) The method of Witzel.⁴ In this method the abdominal cavity is opened, the stomach drawn out, and a moderate-sized rubber tube is inserted into the stomach toward the cardiac extremity, through as small an opening as will admit it. The gastric end is then buried for about two inches by two rows of ordinary Lembert, or Cushing right-angled sutures. The free end of the tube is then brought out through the abdominal wound, and is either fastened there, or possibly after a time may be removed and inserted as needed.⁵ The great advantage of this operation is the ureter-like, oblique entrance of the tube into the stomach; and, as is shown by the post-mortem examination in one of Meyer's cases,⁶ the result is a nipple-like protuberance

¹ *Wien. Med. Woch.*, 1886, Vol. XXXVI, 1073-1110, and *Wien. klin. Woch.*, 1890, 693.

² *Corresp.-bl. f. Schw. Aertze*, 1888, No. 11.

³ *Centralbl. f. Chir.*, 1890, 193.

⁴ *Centralbl. f. Chir.*, 1891, 601.

⁵ I have thus tried to remove the tube temporarily in my patient but had to abandon it from the difficulty of its reintroduction.

⁶ *ANNALS OF SURGERY*, 1893, Vol. XVII, 594.

into the calibre of the stomach, which will prevent effectually the escape of any fluids.

This seems to me to be by far the best method yet devised, as it is simple, moderately rapid, and, above all, as in the present case as well as a few others in which the operation has been done, it is effectual in preventing any leakage.

I did not immediately begin feeding the patient through the tube, as I deemed it safer, the patient being in very fair physical condition, to nourish him for a couple days by rectal enemata. I did, however, introduce an ounce of milk into the stomach the moment the tube was inserted, in order to make sure that perforation of the mucous membrane, as well as the muscular wall, had been effected. I think it likely that in another case, with the courage born of experience, I should be disposed to nourish the patient by small amounts through the tube immediately after the operation. I wished to try with this patient a method which has been used by others, the effect of his chewing meat which had been previously finely hashed, and then washing it into the stomach through the funnel. This gives the patient the satisfaction of mastication and of taste, and at the same time mixes the saliva with the food before its introduction into the stomach. Although not a man of especially sensitive nature, the idea of doing this seemed to disgust the patient so much that he was not willing to attempt it. The result, however, shows that he has received sufficient nourishment to gain somewhat in weight. Whether his constant hunger, in spite of the nourishment taken, is due to the want of satisfaction of his sense of taste, I do not know.

(5) Frank¹ has reported still another method practiced in the clinic of Albert, in Vienna. After making the abdominal incision parallel with the costal cartilages, a narrow fold of the anterior wall of the stomach is drawn out of this wound. A second incision is next made through the skin, half an inch above the first and over the costal cartilages. After separating the skin from the underlying parts, the fold of the stomach wall is drawn out, first through the abdominal wound, then under the

¹ Wien, klin. Woch., 1893, No. 13.

skin, and, finally, through the second opening, and is fixed there, the mucous membrane being stitched to the skin. Whether experience will show this to be more valuable and more easily done than the method of Witzel cannot yet be determined. It is said that no leakage occurs. Of course, as pointed out by the author, it would not be advisable in cicatricial stricture of the œsophagus, because the fistula could not easily be closed, should it be desired to do this at any time.

It is interesting to note that Zweifel,¹ of Leipzig, has used the same process as Witzel in making an artificial urethra. This idea was suggested by Witzel in his paper. In a case of carcinoma of the urethra in a woman, Zweifel extirpated the entire urethra and part of the bladder, closed the latter viscus, and then by a supra-pubic cystotomy made an artificial urethra after Witzel's method.

The mortality of the operation was last collectively investigated by the late Samuel W. Gross.² At that time Gross collected 207 gastrostomies, with sixty-one deaths, a mortality of 29.47 per cent., with a prolongation of life, on an average, at the date of the last reports, of eighty-three days.

Comparing gastrostomy with other procedures, there were thirty-two cases of œsophagostomy, with nineteen deaths; a mortality of 59.37, and a mean duration of life of fifty-two days. Nineteen internal œsophagotomies, with six deaths, or a mortality of 31.57, and an average prolongation of life of 236 days. Five combined œsophagotomies have resulted in two deaths, a mortality of 40 per cent., and a mean duration of life of 168 days. Five œsophagectomies gave three deaths, a mortality of 60 per cent., and a mean duration of life of fifty days. Three retrograde divulsions all resulted in recovery, with a mean duration of life of twenty-two days.

In the case of Handford, already alluded to, some very interesting physiological experiments were made. He introduced a small rubber tube attached to a female catheter into the stomach, and connecting it with a Marey's registering tambour and

¹ *Centralbl., f. Chir.* 1893, 785.

² *Trans. of the Amer. Surg. Assoc.*, 11, 1885.

clock work revolving drum, he found the respiratory and cardiac curves well marked, but absolute absence of any peristalsis. This he accounted for by the adhesion of the stomach to the abdominal wall. Yet digestion was efficiently performed, probably due to the replacement of this motion by the movement produced by the heart and diaphragm. He observes also that "the rapid introduction of large quantities of food into the stomach, the absence of pleasure in eating and the normal perception of flavors are not incompatible with very perfect digestion and active nutrition." Fine division of the food determined its rapid and easy digestion. Lactic acid was found as early as half an hour after eating. Hydrochloric acid was absent until as late as two hours after the meal.